

PETROLOGICAL AND GEOCHEMICAL STUDIES OF GRANITOIDS FROM MUSHAMPALLI-YERRABALLI AREAS, NALGONDA DISTRICT, TELANGANA, INDIA

¹Putta Praveen*, ¹G. Prabhakar, ²M. Anjaneyulu, ¹M. Dinesh and ³K. Praveen

¹*Department of Geology, Osmania University, Hyderabad, Telangana*

²*Department of Geology, Mahatma Gandhi University, Nalgonda, Telangana*

³*Department of Applied Geochemistry, Osmania University, Hyderabad, Telangana*

**E-mail: praveenreddy.putta@gmail.com*

Abstract

The present study deals with the petrological and geochemical studies carried out on the granitoids from the Precambrian Peninsular Gneissic Complex (PGC), located in the NE part of Nalgonda area which belongs to Eastern Dharwar Craton. The granites of this area are emplaced into an older basement complex having granite-gneisses. These granites form a part of Mushampalli-Yerraballi area where the lithological variants range from grey granite-pink granite-granodiorite and host mafic magmatic enclaves. Megascopically, the granites are medium to coarse-grained, leucocratic, inequigranular and show porphyritic texture. Mineralogically, these are composed of K-feldspar (microcline) (20-35%), plagioclase (23-30%) and quartz (28-42%). Mafic minerals include hornblende (1-4%) and biotite (2-4%). Minor minerals like zircon, apatite and magnetite constitute the accessory phases. The presence of two feldspars is attributed to sub-solvus conditions of crystallization of the parental magma. The major oxide compositions are marked by high SiO₂ (68.05-75.5%), low Na₂O (2.47-3.16%), and rather high K₂O (3.52-5.87%), with a calc-alkaline signature and relatively low iron content. These granites are suggested to have originated from a LILE-enriched lithospheric mantle. The chondrite normalized REE patterns of these granites display LREE-enrichment and HREE-depleted patterns, where a high LREE/HREE ratio hints at fractional crystallization as a major process. The negative Eu anomaly indicates the role of feldspar in the genesis of monzogranites. In Y+Nb trace element tectonic discrimination plot, these granites fall in volcanic arc granite to syn-collisional granite fields.

Keywords: Monzogranites, Fractional crystallization, Eu anomaly, Precambrian crystalline complex.